Remarks

Applicants submit this amendment pursuant to 37 CFR §1.114 as a request for continued examination, payment of the fee pursuant to 37 CFR§1.17(r) is effected by a Fee Transmittal form submitted herewith. It is respectfully requested that the finality of the Office Action mailed 7 January 2004 be withdrawn and the amendments submitted hereby be entered and considered.

In the Office Action Summary of the action mailed 7 January 2004 at line 4 it is stated that claims 1 –12 are pending in the application; and, at line 6 that claims 1 – 8, 11 and 12 are rejected. It is noted that with the response to the Office Action mailed 4 August 2003, claim 6 was cancelled. Hence the recitation of pending claims and the rejection of claims of the Office Action Summary require correction.

The Examiner has rejected claim 1 under 35 USC §112 first paragraph as failing to comply with the written description requirement. The Examiner noted in particular that the claim as previously amended changes the direction the spring biases the knock-bar in relation to the mold member as recited in the claim as previously presented. Further, with reference to arguments presented in the response to the office action mailed 4 August 2003, the Examiner notes the apparent change of direction indicating that reference to the drawings is had for guidance. Although not previously made, the Examiner has made this rejection final. This rejection is traversed. Discussion of this rejection shall be made with reference to the claim as amended hereby. References herein to passages of the written description and drawing figures are made with respect to the published PCT application for which the subject application is a national phase.

The compression of the springs interposed between the knock-out bar and ejector rods is described from page 6, line 31 through page 7, line 5. That written description expressly recites that the springs are compressed with movement of the knock-out bar away from the mold member. Further, the particular movement that results in compression of the springs is referred to as "over-travel" in the description appearing at page 8, lines 4 – 6. In the drawings of the subject application: Fig. 2 shows the ejector pins fully retracted with the ejector plate against rear stops and the front face of the knock-out bar abutting shoulders of the ejector rod(s) (see description from page 5, line 32 to page 6, line 2 and at page 7, lines 1 - 5); Fig. 3 shows the ejector pins advanced with the front face of the knock-out bar abutting shoulders of the ejector rod(s) (see description from page 6, lines 3 – 6); and Fig. 4 shows the

ejector pins fully retracted with the front face of knock-out bar separated from abutting contact with shoulders of the ejector rod(s) (see description at page 3, lines 19 – 21, at page 6, lines 31 – 32, and at page 7, lines 4 – 5). In Fig. 4, the separation of the front face of the knock-out bar from shoulders of the ejector rods represents over-travel of the knock out bar away from the mold member. Advantageously, the ejection apparatus of the invention is operated to effect advance of the knock-out bar from the position shown in Fig. 2 to the position shown in Fig. 3 and thence to retract the knock-out bar through any over-travel as illustrated by the position shown in Fig. 4 and back to the position shown in Fig. 2. From the cited passages of the written description, it is clear that the recitation of claim 1 as presented in the amendment responsive to the office action mailed 4 August 2003 is consistent with the written description of the invention. The current amendment of the claim eliminates the phrase "relative to the ejector plate" as it pertains to the movement of the knock-out bar that compresses the springs. It is believed that phrase was unneeded in light of the written description in respect of compression of the springs occurring with "over-travel" of the knock-out bar. It is contended that the basis for rejection under 35 USC §112, first paragraph cited by the Examiner was contrary to the written description and drawings as originally presented, i.e., that the original written description and drawings contained and illustrated precisely the direction of movement effecting compression of the springs. It is respectfully requested that this rejection be withdrawn.

The Examiner has rejected claim 1 under 35 USC §112, second paragraph as being indefinite and, although not previously made, has made this rejection final. The Examiner noted in particular that the claim recites in the preamble an ejector plate, ejector rod, and electric motor and later specifies the ejector apparatus as further comprising a cam connected to the shaft. This rejection is traversed. Discussion of this rejection shall be made with reference to the claims as amended hereby.

Claim 1 is drawn to an ejection apparatus for separating a molded part from a surface of a mold cavity defined by mold members of a mold assembly. The preamble of Claim 1, as amended hereby, includes a recitation of ejector pins and an ejector plate as elements of a mold assembly. The ejection apparatus as now claimed comprises the knock-out bar and ejector rod(s), and the motor and cam arrangement for moving the knock-out bar. Movement of the knock-out bar effects movement of the ejector plate and ejector pins for separating a molded part from the mold assembly. It is contended that Claim 1 as amended particularly

points out and distinctly claims the subject matter of the invention, overcoming the rejection under 35 USC §112, second paragraph. It is respectfully requested that this rejection be withdrawn.

The Examiner has rejected claims 1-5 under 35 USC §103(a) as being unpatentable over Stehr (4735080) in view of Kamiguchi (5736079) and Rees (3726625); and has made this rejection final. This rejection is traversed and shall be discussed with reference to the claims as amended hereby.

In the rejection of claims 1 – 5 the Examiner notes in particular that: Stehr teaches an ejector drive with a rotational shaft, a cam and cam follower that convert rotation of the shaft to linear back and forth movement of the ejector pin, and that a motor is needed to rotate the shaft, but Stehr fails to teach pins having enlarged stop members and compression springs, ejector rods slidably carried by knockout bar and spring positioned between end of ejector rod and knockout bar and a specific type of motor; Kamiguchi teaches the claimed apparatus with a servomotor; and Rees teaches a slidably movable knockout bar and spring for urging a pusher rod towards the rear for ejecting molded articles. The Examiner concluded it would have been obvious to one of ordinary skill in the art to have modified Stehr with stop members, flange and spring as taught by Rees to limit rearward displacement of the rod and to eject molded articles when the rod is urged toward the mold and an electric motor as taught by Kamiguchi.

Stehr discloses an ejector mechanism carried on the ram (3) of a press, the ejector mechanism comprising pivotably mounted lever(s) (10) for converting rotation of cam disk(s) (11) to reciprocation of ejector pin(s) (9). Stehr expressly provides that a cam disk is provided for each ejector pin. As Stehr does not teach or suggest any arrangement of a knock out bar, ejector rod and ejector plate to which are connected ejector pins, Stehr does not teach or suggest that an ejector rod be slidably carried by a knock-out bar for limited relative movement as required by the claims of the subject application.

Noting that Kamiguchi *et al.* disclose the apparatus as claimed with a servomotor, the Examiner emphasizes that while Stehr fails to disclose a specific type of motor, any type of motor could be used that has the equivalent function of rotational movement.

Rees discloses a passive actuator for ejector pins (20) being operated by reciprocation of a movable platen (12) carrying a mold portion (14). The ejector pins are advanced into mold cavities (19) by movement of plate (21) toward the movable platen. A pusher rod (24)

operating through an articulated linkage effects movement of the plate. A spring (24) biases the pusher rod for retraction of the plate away from the movable platen. Nothing in Rees teaches or suggests an arrangement having a knock-out bar and ejector rods for effecting movement of an ejector plate to which are connected ejector pins. As Rees teaches that the rods 20 are fixedly secured to the plate 21 (column 2, lines 18 – 21), nothing in Rees teaches or suggests having ejector rods slidably carried by a knock-out bar for limited relative movement as required by the claims of the subject application.

The Examiner has characterized Kamiguchi *et al.* as disclosing the apparatus as claimed and has characterized Rees as teaching a spring on the pusher rod for urging the rod towards the rear for ejecting molded articles. Kamiguchi *et al.* disclose return springs 17 for biasing ejector plate 16 ***away*** from movable mold 8, hence biasing members of the ejection apparatus to hold the ejector pins in a retracted position. The return springs 17 of Kamiguchi *et al.* are ***compressed*** by movement of ejector plate 16 ***toward*** movable mold 8, that movement being effected by movement of ejector rod 2 to advance ejector pins 6 into the mold cavities to eject molded articles. Rees discloses spring 26 for biasing pusher rod 25 ***away*** from movable platen 12, holding ejector pins 20 in a retracted position (see column 2, lines 26 – 28). In the apparatus of Rees, molded articles are ejected by ***relative*** movement of movable platen 12 and pusher rod 25 to ***compress*** spring 26, i.e., ***relative*** movement of pusher rod 25 and movable platen 12 ***toward*** one another. The required ***relative*** movement is effected by retraction of movable platen 12 towards adjustable stop 35 on frame 15 and contact of pusher rod 25 with adjustable stop 35 during that retraction.

In contrast to the constructions of Kamiguchi *et al.* and Rees, the present invention as now claimed, provides that ejector rod(s) are connected to the ejector plate for movement therewith and are slidably supported by the knock-out bar for limited movement relative thereto. Spring(s) interposed between ends of the ejector rod(s) and the knock-out bar are ***compressed*** by over-travel of the knock-out bar away from the mold member. Hence, unlike the springs of Kamiguchi and Rees, which bias the relevant members to hold the ejector pins retracted from the mold and are compressed by (relative) movement of members ***toward*** the mold members, the springs of the present invention are compressed by (resist) over-travel of the (relative) movement of the knock-out bar ***away*** from the mold members.

As described at page 7 lines 4 – 5 of the subject application, the compression of the springs with the over-travel of the knock-out bar provides a cushioning effect. Continuous

drive of the motor in one direction effects movement of the knock out bar from the position shown in Fig. 2, through the position shown in Fig. 3, back to the position shown in Fig. 2. In the course of this movement, the ejector plate is displaced from and returned to abutting contact with the positive stops as illustrated in Figs. 2 and 3. It will be appreciated that the cushioning effect of compression of the springs with the over-travel (illustrated in Fig. 4) allows for continued retraction of the knock-out bar while the ejector plate is held fully retracted against the positive stops. Hence, unlike the springs of Kamiguchi *et al.* and Rees, the springs of the present invention do not bias members of the ejection apparatus to hold ejector pins retracted from the mold cavity. Clearly, nothing in the combination of Stehr and Rees teach or suggest the arrangement of a knock-out bar and ejector rod(s) connected with an ejector plate for effecting motion of ejector pins as now claimed. Further, nothing in the cited references teaches or suggests an arrangement of an ejector plate, ejector rods and knock-out bar wherein the ejector rods are connected to the ejector plate for movement therewith and slidably supported by the knock-out bar for limited movement relative thereto. Nor do the cited references teach or suggest an arrangement wherein springs are compressed on over-travel of a knock-out bar ***away*** from mold members. In light of the combination of the references relied on by the Examiner to teach or suggest the ejection apparatus of claims 1 – 5, it is submitted that claims 1 – 5 patentably distinguish over that combination of references. It is respectfully requested that the rejection be withdrawn.

The Examiner has rejected claims 6 and 12 under 35 USC §103(a) as being unpatentable over Kamiguchi (5736079) in view of Stehr (4735080) and Rees (3726625) as applied to claims 1 – 5 and further in view of Rahn *et al.* (5067892) and Sharman (3680998) noting in particular that: Stehr, Kamiguchi and Rees fail to teach among other things, a cam track offset from the axis of the drive shaft and a motor driving a pulley including a one way clutch coupled with an ejector drive system and a second pulley drive system for the opposite direction; Rahn *et al.* teaches a cam track that is offset from the axis of the drive shaft; and, Sharman teaches an electric motor that connects to a pulley and clutch for driving the main drive shaft, and concluding the use of a secondary pulley and clutch system for the other direction is a duplication of parts that has no patentable significance. The Examiner concluded that it would have been obvious to one of ordinary skill in the art to have changed Stehr with an offset cam track as taught by Rahn *et al.* and clutch mechanism as taught by Sharman.

The Examiner has made this rejection final. This rejection is traversed. Discussion of this rejection shall be made with reference to the claims as amended hereby.

Claim 6 has been canceled. Hence, the rejection of claim 6 is in error and of no effect.

It is noted that the rejection of claims 1 – 5 referenced in this rejection is based on Stehr in view of Kamiguchi *et al.* and Rees, rather than on Kamiguchi *et al.* in view of Stehr and Rees as stated by the Examiner. As Kamiguchi *et al.* disclose an ejector drive apparatus having motor driven screws (ball threads10) engaging nuts (ball nuts 11) to effect linear movement of pusher plate 12, it is contended that modification of Kamiguchi with the cam drive of Stehr is misplaced. That is, there is simply no advantageous application of the cam drive of Stehr to the drive apparatus of Kamiguchi *et al.*

To the extent that the rejection of claim 12 is based on Stehr in view of Kamiguchi *et al.* and Rees as applied to claims 1-5, the foregoing discussion of the application of those references to those claims is equally applicable to this rejection. As claim 12 is dependent from claim 1, and as neither claim 1 nor claim 12 require a substantially circular cam track or that the cam track be offset from the axis of the drive shaft that rotates the cam member, it is believed that the citation to Rahn *et al.* of this rejection is not applicable to claim 12. Nevertheless, as Rahn *et al.* disclose a lobed cam, Rahn *et al.* do not teach or suggest a substantially circular cam track and do not teach or suggest that the cam track axis be offset from the axis of the drive shaft that rotates the cam member. Rahn *et al.* do not teach or suggest any arrangement comprising clutches whatsoever. Sharman discloses a motor driven press wherein a pulley and clutch mechanism are interposed between the drive motor (19) and main drive shaft (20). Nothing in Sharman teaches or suggests that the clutch be a one-way clutch that drives a mechanism only when the motor rotates in one direction. Nor does Sharman teach or suggest first and second one-way clutches operatively coupled with the motor so that one mechanism of the press is operated only when the motor rotates in one direction and a second mechanism of the press is operated only when the motor rotates in the opposite direction.

In contrast to the pulley and clutch of Sharman, claim 12 requires first and second one-way clutches to selectively operate the ejector drive system and a second drive system according to the direction of rotation of the motor. Contrary to the conclusion of the Examiner, the recitation of claim 12 is not a mere duplication of elements, as each of the first and second one-way clutches recited in claim 12 perform different functions as expressly recited. In light

of the patentability of claims 1 – 5 over the combination of Stehr, Kamiguchi *et al.* and Rees, and in light of the shortcomings of Rahn *et al.* and Sharman to teach or suggest the clutch arrangement of claim 12, it is contended that claim 12 is patentably distinct over the combination of references relied on by the Examiner. It is respectfully requested that the rejection of claim 12 be withdrawn.

The Examiner has rejected claims 7, 8 and 11 under 35 USC §103(a) as being unpatentable over Stehr (4735080) in view of Kamiguchi (5736079) and Rees (372665) as applied to claims 1 – 5 and further in view of Stehr (4552525) noting in particular that Stehr ('080) fails to teach a cam member with means for adjusting the relative offset of the cam track and a cam track having a portion that generates a pulsation in the linear movement; that Stehr ('525) teaches a cam member that has an adjustable means that provide for adjusting the relative offset of the cam track and that the shape of the cam allows for pulsation. The Examiner concluded that it would have been obvious to one of ordinary skill in the art to modify Stehr ('080) with means for adjusting the relative offset of the cam track and the shape of the cam track varies the substantially circular path of the cam track as taught by Stehr ('525) because it allows for adjustment of the movement of the elements. The Examiner has made this rejection final. This rejection is traversed. Discussion of this rejection shall be made with reference to the claims as amended hereby.

To the extent that the rejection of claims 7, 8 and 11 is based on Stehr in view of Kamiguchi *et al.* and Rees as applied to claims 1-5, the foregoing discussion of application of those references to those claims is equally applicable to this rejection. Stehr ('525) discloses a drive mechanism for ejector pins (2) wherein a lever member (5) having a French curve (10) adjustably positioned on the lever member is interposed between a drive means and an ejector lever member (3). The position of the French curve is adjusted by an adjusting screw (14) and the French curve includes circumferential/tangential cam sections (see column 1 at lines 56 – 57). Nothing in Stehr ('525) teaches or suggests a substantially circular cam track. It is noted that claim 5 requires a substantially circular cam track and by this amendment requires that the cam track axis be offset from the axis of the drive shaft that rotates the cam member (as described at page 8, lines 1 – 2 (published PCT application)). In contrast to Stehr ('525), the inventions of claims 7 and 8, dependent directly or indirectly from claim 5, provide that the cam member includes a substantially circular cam track and that the cam track axis be offset from the axis of the drive shaft that rotates the cam member so that the cam follower

moves linearly. In light of the dependence of claims 7 and 8 from base claims patentably distinct over the combination of Stehr ('080), Kamiguchi *et al.* and Rees, and in light of the further distinction of claims 7 and 8 in respect of the teachings of Stehr ('525) it is contended that these claims are patentably distinct over the combination of references cited by the Examiner. It is respectfully requested that this rejection be withdrawn.

Stehr ('525) does not teach or suggest any pulsation in the linear movement of the ejector pin. Nor has the Examiner cited anything in Stehr ('525) as teaching or suggesting any pulsation in the linear movement of the ejector pin or any shape of a cam to produce such a pulsation. Claim 11 expressly requires that the cam track includes at least one portion that varies from the substantially circular path of the cam track to generate a pulsation in the linear movement of the ejector plate when the cam member is rotated. In light of the dependence of claim 11 from claim 5, contended herein to be patentably distinct over the combination of Stehr ('080), Kamiguchi *et al.* and Rees, and in light of the further distinction of claim 11 in respect of the teachings of Stehr ('525) it is contended that claim 11 is patentably distinct over the combination of references cited by the Examiner. It is respectfully requested that this rejection be withdrawn.

The Examiner has objected to claims 9 and 10 as being dependent from a rejected base claim. In light of the amendment of claims hereby it is submitted that the base claims are now patentably distinct over the references and that the basis of this objection is overcome.

It is believed that the claims as amended patentably distinguish over the references whether considered singly under 35 USC §102, or in combination under 35 USC§103 and that the application is now in condition for allowance. Reconsideration of the application as amended is respectfully requested and an early notice of allowance is earnestly solicited.

Respectfully Submitted,

By _____
John W. Gregg, Attorney
Reg. # 29925
513/487-5980